

harvesting software coupled to the master cache and the gateway for processing information corresponding to probability distributions that the local caches satisfy requests from their respective users to predictively distribute the desired content to the respective users.

The Examiner's position is that the Malkin et al. patent discloses a content server 20 that corresponds to the presently claimed master cache, a proxy server for receiving content that is distributed by the data distribution system from the master cache, one or more local caches that presumably correspond to the presently claimed one or more local caches, and harvesting software for processing information corresponding to probability distributions that the local caches satisfy requests from their respective users to predictively distribute the desired content to the respective users, citing Fig. 2; column 6 relating to proxy server logic 295. The Examiner admitted that the Malkin et al. patent "does not explicitly disclose a gateway connected to the master cache", but has taken Official Notice that the concept and advantages of using a Gateway to connect a resource distribution network to a subscriber or client network is old and well known in the network communication art."

It is stated in the Malkin et al. patent that

"To reduce access latencies for clients, the prior art has stored or cached copies of popular documents of information closer to the user at network nodes, from which the access latencies are more acceptable. The caching can be implemented at various points on the network. For example, a large university or corporation may have its own local cache, from which all the users subscribing to that network may fetch documents. A local cache may be implemented in the form of a specialized server.

A specialized server, which is called a caching proxy, may act as an agent on the behalf of clients to locate any potential cached copy of requested information. Caching proxies usually serve as secondary or higher level caches because caching proxies are concerned only with misses left over from failed client caches. Client caches are built into various Web browsers. Client caches may either store only the document accesses during the current invocation (nonpersistent cache such as Mosaic) or may cache documents across invocations."

The Malkin et al. patent discloses that

"The present invention is directed toward a method and apparatus for prefetching information in a proxy hierarchy to reduce object access time through the network (i.e. Internet) for clients. The method and apparatus prefetches select information from a content server to make the select information readily accessible to clients associated with a content server in a network. The clients are preferably associated with proxy servers in the network. The clients request information from at least one of the proxy servers. The content server generates prefetch hint information for the clients based on past data access patterns of the requested information by the clients. The content server annotates the requested information with prefetch hint information. One or more proxy servers may dynamically update the prefetch hint information based on dynamic usage statistics. The prefetch hint information is updated as the object passes through the proxy hierarchy to reflect prefetch operations performed, caching status at higher levels of the proxy hierarchy, and other local considerations, such as local reference patterns. Select information may be prefetched from the content server or any of the proxy servers based upon the prefetch hint information and the requested information. The prefetch hint information may be assigned a prefetch value based upon reference access probability and storage considerations. The select information with the highest prefetch values in the prefetch hint information list are cached first and potentially until the prefetch cache is filled."

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Notwithstanding the Examiner's position, it is respectfully submitted that the Malkin et al. patent does not disclose or suggest "harvesting software coupled to the master cache and the gateway for processing information corresponding to probability distributions that the local caches satisfy requests from their respective users to predictively distribute the desired content to the respective users." The Malkin et al. patent states that it discloses a "method for prefetching data identifies data access patterns and prefetches select information based on a dynamic interpretation of the data access patterns". It is respectfully submitted that this is not a disclosure or suggestion regarding processing information corresponding to probability distributions to predictively distribute the desired content to the respective users. There is no predictive distribution disclosed or suggested in the Malkin et al. patent. The term predict is used in the Malkin et al. patent one time to discuss dynamically tracking of viewer reference behavior, static analysis or mining on Web logs. It is stated in the Malkin et al. patent that

"In addition to dynamically tracking the viewer reference behavior, static analysis or mining on Web logs can be performed periodically to derive information on group of objects for the statistics table 261. The mining algorithm identifies groups of objects that are referenced together to obtain potential prefetch candidates for PHI. One method for mining Web logs to derive reference pattern is described in: "SpeedTracer: A Web Usage Mining and Analysis Tool", by Kunlung Wu, et al., IBM Research Report 20895, May 1997. The SpeedTracer algorithm provides information on frequent groups of pages referenced together in a user session and the frequent traversal path. The SpeedTracer algorithm is an in-depth type of mining that can uncover related references that are not immediately referenced together. It can also make better prediction on the next set of referenced objects based on the traversal path to a given object."

It is stated in the Malkin et al. patent that "The prefetch hint information may be assigned a prefetch value based upon reference access probability and storage considerations. The select information with the highest prefetch values in the prefetch hint information list are cached first and potentially until the prefetch cache is filled."

It is also stated in the Malkin et al. patent that "FIG. 6 depicts an example of the generating unit 266 for generating prefetch hint information into a prefetch hint information list. The prefetch hint information list contains child object identifiers of child objects if the ratio of the second count to the first count exceeds a hint threshold. The prefetch hint information list represents a refined or filtered access list. That is, the generating unit 266 accepts inputs from the statistics table 261 and filters the inputs to obtain the prefetch hint information list."

From the above-quoted portion of the Malkin et al. patent, and from a detailed reading of the Malkin et al. patent, it is respectfully submitted that whatever processing relating to probabilities is performed in the proxy servers. There is absolutely no disclosure or suggestion in the Malkin et al. patent regarding harvesting software coupled to the master cache for processing information corresponding to probability distributions that the local caches satisfy requests from their respective users to predictively distribute the desired content to the respective users.

Thus, while the Malkin et al. patent discusses computations based upon probability, there is no disclosure or suggestion in the Malkin et al. patent regarding predictive distribution

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of desired content to the respective users. The Malkin et al. patent contains no discussion regarding predictive distribution of information to users. The Malkin et al. patent does not disclose or suggest anything regarding harvesting software that processes information contained in transmit hit/miss data and probability tables. Probability tables are not disclosed or suggested in the Malkin et al. patent.

The Examiner has taken Official Notice that the concept and advantages of using a Gateway to connect a resource distribution network to a subscriber or client network is old and well known in the network communication art. However, it is respectfully submitted that notwithstanding this fact, there is no disclosure or suggestion in the Malkin et al. patent as to the need for a gateway or where such a gateway would be disposed. It is respectfully submitted that a gateway is not disclosed or suggested in the Malkin et al. patent because it is not necessary and in fact the proxy servers essentially perform the function of a gateway which links the clients to the network (Internet). Furthermore, if, as the Examiner states, gateways are old and well known in the network communication art, then if one were necessary in the Malkin et al. system, then it would have been disclosed or suggested by them.

Therefore, with regard to Claim 1, it is therefore respectfully submitted that the Malkin et al. patent does not disclose or suggest "a gateway for receiving content that is distributed by the data distribution system from the master cache" or "harvesting software coupled to the master cache and the gateway for processing information corresponding to probability distributions that the local caches satisfy requests from their respective users to predictively distribute the desired content to the respective users", as is recited therein.

Accordingly, it is respectfully submitted that Claim 1 is not obvious in view of the Malkin et al. patent and is patentable thereover. Therefore, withdrawal of the Examiner's rejection of Claim 1 is respectfully requested.

With regard to Claim 2, it is respectfully submitted that the Malkin et al. patent does not disclose or suggest that the "harvesting software processes information contained in transmit hit/miss data and probability tables generated at the gateway", as is recited therein. The Malkin et al. patent discloses that the proxy server contains a first update statistics routine 264 whose processing is disclosed with reference to Fig. 5. It is stated in the Malkin et al. patent that the "first update statistics routine 264 updates one of said statistics tables 261", and that "The statistic updating unit 252 first looks for information in a referrer object. The requested object is then placed on an access list or a prefetch list of the referrer object."

Fig. 5 is discussed as follows.

"Beginning at reference block 505, the statistics table 261 is updated to reflect that object O has been referenced one more time by incrementing the first count. In other words, in block 505 TCount(O) is incremented by one. If object O is not yet in the statistics table 261, a parent object identifier is inserted into the statistics table 261 with TCount(O) initialized to one. The new parent object identifier replaces the least recently referenced entry in the statistics table 261, if no empty slot is available in the statistics table 261. In decision symbol 510, the requested object is checked for referrer information by, for instance, checking the object header of the requested object. For example, in HTTP protocol, referrer object is provided in the header to

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indicate which object contains the HTTP link to the requested object. If a referrer object (R) is found in the header, in step 520 the statistics table 261 is examined to see whether object O is already on the access list of object R. If so, the second count (i.e. RCount(O)) is incremented by one in block 530 for the requested object. Otherwise, in block 525 the requested object (i.e. Object O) is inserted into the access list of the child object (i.e. object R) with the second count (i.e. RCount(O)) initialized to one."

Therefore, it is respectfully submitted that this description regard the statistics table is not a disclosure or suggestion regarding harvesting software that processes information contained in transmit hit/miss data and probability tables generated at a gateway. It is stated in the Malkin et al. patent that "data access patterns are preferably stored in a statistics table." Furthermore, It is stated in the Malkin et al. patent that a "statistics table" is "stored in one or more proxy servers", and that the statistics table "stores parent object identifiers and associated child object identifiers". It is stated that the statistics table contains "first counts of parent objects" that represent "the frequency in which parent objects are referenced by the clients", and "second counts of child objects" that represent "the frequency in which the corresponding child objects are referenced after select ones of the parent objects are referenced". The stored data does not correspond to probability tables. It is therefore respectfully submitted that the Malkin et al. patent discloses or suggest nothing regarding probability tables.

Therefore, it is respectfully submitted that Claim 2 is not obvious in view of the Malkin et al. patent and is patentable thereover. Dependent Claim 2 is also considered patentable based upon the patentability of Claim 1 from which it depends. Withdrawal of the Examiner's rejection of Claim 2 is respectfully requested.

Dependent Claims 3 and 4 are considered patentable based upon the patentability of Claim 1 from which they depend. Withdrawal of the Examiner's rejection of Claims 3 and 4 is respectfully requested.

With regard to Claim 5, it recites details of the gateway employed in the system of Claim 1. As was admitted by the Examiner, the Malkin et al. patent does not explicitly disclose a gateway. Therefore, it is respectfully submitted that the Malkin et al. patent does not disclose the details of the gateway recited in Claim 5.

It is respectfully submitted that the Malkin et al. patent does not disclose or suggest "a pseudo client for receiving an entitlement message indicating that that content has arrived at the gateway, for enabling the gateway as a sibling cache for the local cache, for requesting content to be transferred from the sibling cache to the local cache, for verifying that content has been transferred to the local cache during the transfer process, for disabling the gateway as a sibling cache of the local cache at the completion of the process" There is no discussion regarding clients, entitlement messages, or sibling caches disclosed or suggested in the Malkin et al. patent. The Examiner has admitted this.

However, the Examiner stated that "Malkin does disclose that the proxy server communicates with the local cache system of the client to request content on behalf of the client from the content server using the prefetch updating means and communication protocol used there-

between." It is respectfully submitted that this is not a disclosure or suggestion of the details of the gateway employed in the present system. The Examiner's arguments amount to unsupported speculation and are clearly unsupported by the teachings of the Malkin et al. patent.

Therefore, it is respectfully submitted that Claim 5 is not obvious in view of the Malkin et al. patent and is patentable thereover. Dependent Claim 5 is also considered patentable based upon the patentability of Claim 1 from which it depends. Withdrawal of the Examiner's rejection of Claim 5 is respectfully requested.

Dependent Claims 6 and 7 are considered patentable based upon the patentability of Claim 1 from which they depend. Withdrawal of the Examiner's rejection of Claims 6 and 7 is respectfully requested.

Claim 8 recites details of the harvesting software employed in the present invention. It is respectfully submitted that the Malkin et al. patent contains no disclosure regarding harvesting software that is coupled to a master cache and a gateway. It is also respectfully submitted that the Malkin et al. patent does not disclose or suggest "processes statistics derived from the master cache and the local caches to produces a list of content to add to the master cache and a list of content to delete from the master cache", "forms a pseudo client to retrieve and verify the content to be added to the master cache", and "transmits the verified content from the master cache to the local caches" as is recited therein. The term pseudo client is not even used in the Malkin et al. patent.

However, the Examiner stated that "Malkin discloses that proxy server logic 295 and content server logic 268 communicate statistical information to predictively retrieve or delete content based on probability calculated from clients request history." Even if it is assumed arguendo that the Examiner's statement is correct, this does not amount to a disclosure or suggestion regarding forming a pseudo client. There is clearly no disclosure or suggestion in the Malkin et al. patent regarding forming a pseudo client.

Therefore, it is respectfully submitted that Claim 8 is not obvious in view of the Malkin et al. patent and is patentable thereover. Dependent Claim 8 is also considered patentable based upon the patentability of Claim 1 from which it depends. Withdrawal of the Examiner's rejection of Claim 8 is respectfully requested.

Independent Claim 9 provides for a method for transferring content distributed by a data distribution system to a gateway into a local cache. The method comprises creating a pseudo client on the gateway, receiving an interrupt at the pseudo client indicating that that content has arrived at the gateway, enabling the gateway as a sibling cache for the local cache, requesting content to be transferred from the sibling cache to the local cache, verifying that content has been transferred to the local cache during the transfer process, disabling the gateway as a sibling cache of the local cache at the completion of the process, and causing the local cache to retrieve the content from the sibling cache until all content has been transferred.

With regard to the claimed aspects recited in Claim 9, it is respectfully submitted that there is no disclosure or suggestion in the Malkin et al. patent regarding "creating a pseudo

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client on the gateway". The term "pseudo client" is not used in the Malkin et al. patent nor is there any disclosure that would correspond to a pseudo client. There is no disclosure or suggestion in the Malkin et al. patent regarding "receiving an interrupt at the pseudo client". There is no disclosure or suggestion in the Malkin et al. patent regarding "enabling the gateway as a sibling cache for the local cache". There is no disclosure or suggestion in the Malkin et al. patent regarding "requesting content to be transferred from the sibling cache to the local cache". There is no disclosure or suggestion in the Malkin et al. patent regarding "verifying that content has been transferred to the local cache during the transfer process" in the context of the recitation of Claim 9. There is no disclosure or suggestion in the Malkin et al. patent regarding "disabling the gateway as a sibling cache of the local cache at the completion of the process". There is no disclosure or suggestion in the Malkin et al. patent regarding "causing the local cache to retrieve the content from the sibling cache until all content has been transferred.

The detailed method steps recited in Claim 9 are considered patentable over the teachings of the Malkin et al. patent for the reasons argued above. Therefore, it is respectfully submitted that Claim 9 is not obvious in view of the Malkin et al. patent and is patentable thereover. Withdrawal of the Examiner's rejection of Claim 9 is respectfully requested.

Independent Claim 10 provides for a method for building a master cache used to transfer content by way of a data distribution system to a local cache. This method comprises processing statistics derived from the master cache and the local cache to produce a list of content to add to the master cache and a list of content to delete from the master cache, forming a pseudo client to retrieve and verify the content to be added to the master cache, and transmitting the verified content from the master cache to the local cache.

It is respectfully submitted that there is no disclosure or suggestion in the Malkin et al. patent regarding either "processing statistics derived from the master cache and the local cache to produce a list of content to add to the master cache and a list of content to delete from the master cache", or "forming a pseudo client to retrieve and verify the content to be added to the master cache". There is no disclosure or suggestion in the Malkin et al. patent regarding these steps. There is no pseudo client formed to retrieve and verify the content to be added to the master cache employed in the Malkin et al. system.

Therefore, it is respectfully submitted that Claim 10 is not obvious in view of the Malkin et al. patent and is patentable thereover. Withdrawal of the Examiner's rejection of Claim 10 is respectfully requested.

Dependent Claims 11 and 12 are considered patentable based upon the patentability of Claim 10 from which they depend. Also, with regard to Claim 11, the Malkin et al. patent discloses or suggests nothing regarding "processing information corresponding to probability distributions that the local caches satisfy requests from their respective users to predictively distribute the desired content to the respective users". Probability distributions are not discussed in the Malkin et al. patent. With regard to Claim 12, the Malkin et al. patent discloses

or suggests nothing regarding "processing information contained in transmit hit/miss data and probability tables". Probability tables are not discussed in the Malkin et al. patent.

Therefore, it is respectfully submitted that Claims 11 and 12 are not obvious in view of the Malkin et al. patent and are patentable thereover. Withdrawal of the Examiner's rejection of Claims 11 and 12 is respectfully requested.


Claims 13-16 are considered patentable for the reasons argued above with regard to the other pending Claims. Therefore, it is respectfully submitted that Claims 13-16 are not obvious in view of the Malkin et al. patent and are patentable thereover. Withdrawal of the Examiner's rejection of Claims 13-16 is respectfully requested.

Newly added Claims 17-19 address a specific satellite-based data distribution system which is implemented in a preferred embodiment of the present invention. Claims 17-19 are considered patentable for the reasons argued above with regard to the other pending Claims and because there is clearly nothing disclosed or suggested in the Malkin et al. patent regarding anything other than a network interconnecting the content and proxy servers, and nothing is disclosed or suggested regarding a satellite-based data distribution system. Therefore, it is respectfully submitted that Claims 17-19 are not obvious in view of the Malkin et al. patent and are patentable thereover. Allowance of Claims 13-16 is respectfully requested.

The prior art cited by the Examiner but not applied is considered relevant to the extent indicated by the Examiner.

In view of the above amendments and arguments, it is respectfully submitted that all presently pending Claims are not obvious in view of the cited patent and are allowable over the art of record. Therefore, it is respectfully submitted that the present application is in condition for allowance. Reconsideration and allowance of this application are earnestly solicited.

Respectfully submitted,



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